Tewksbury Water Department

2018 Consumer Confidence Report

Water System ID# 3295000

This report details information such as water quality, where your water comes from and how it is processed. More information on your water system can be found at:

http://www.tewksbury-ma.gov/water-treatment-plant or /water-sewer-division

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This report is mandated by the Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MaDEP). Much of this report consists of required language which may or may not be relevant to the Tewksbury Water System. Please feel free to contact the Treatment Plant for further clarification. If English is not your first language please have this report translated. *Si Ingles no es su primer idioma, por favor traduzca el informe.*

WHERE DOES OUR WATER COME FROM?

The Merrimack River covers over 4,672 square miles between the States of New Hampshire and Massachusetts. The Merrimack River actually starts at Weirs Beach, Lake Winnipesauke. Because of the large recharge area the Merrimack River has a very large capacity to supply water even during extended droughts. Last year's historical drought showed that even with very low water recharge our facility was able to easily operate with little noticeable difference in the river levels.
Over the last 30 years the river has undergone a tremendous change as far as water quality is concerned. Upstream wastewater plants installed in the late 1980's and elimination of hidden outfalls has contributed to the "B" classification of the river water.

Our intake station is directly alongside the river and is designed to survive flooding up to six feet above the embankments. The building is actually built as a solid piece of concrete and goes two stories below the ground. Intake screens located on the bottom of the river draw water in while 1/8" slots prevent any debris from entering the waterworks.

HOW IS OUT WATER TREATED?

The water plant is considered a "conventional" treatment facility. The water is treated in multiple stages called unit processes. The idea is that any one or more unit process can fail and still produce potable drinking water. During the construction many of the unit process were improved with new equipment and a totally new computer system to operate the facility.

Screening: As mentioned above 1/8" slotted screens are used to prevent any damaging debris from entering the treatment stream. The screens are made of stainless steel and are inspect and cleaned every few years using construction divers. Compressed air is used to keep the screens cleared of any settling debris. Yes, they are fish friendly and approved by Fish and Wildlife to insure that fish will not be trapped by the screens.

Disinfection: Chlorine Dioxide and Bleach are used to disinfect the water and to help remove color and other organic components. Actually Chlorine Dioxide by itself achieves a near100% kill of all bacteria, but the water is then disinfected two more times using bleach. A new & improved control system along with new chlorine analyzers will allow the operators to more precisely control the chlorine levels in the process.

Coagulation: Coagulation is a process whereby ALUM is added to the water to produce a sticky material referred to as "floc". Sticky floc surrounds all particles and causes them to easily settle out via the sedimentation process. This produces clarified water that is then filtered in the next unit process. Good settling and consistent chemical addition is the key to good treatment. This has been augment by a new equalizing tank which will allow the process to run in a very consistent flow rate. This serves to improve chemical addition and eliminates flow surges which can "fluff" the floc particles.

Filtration: Clarified water is fed four dual media filters. These filters have granulated activated carbon (GAC) and fine filter sand. The GAC removes any remaining particles and absorbs any remaining organic compounds including taste and odor contaminants. The sand acts as a secondary barrier to make sure no microscopic particles can penetrate the filter. As a result Tewksbury water is typically crystal clear. All filters are cleaned once a day by backwashing and the GAC is replaced every two years well before the activation is exhausted. Our oldest filters (#1 &#2) were totally rehabilitated with new cells components and improved bottom drains made of polyethylene plastic. Additionally the Backwashing Bridge was rebuilt with a new drive system. We are now ready for another 20-30 years of water filtration.

Final Treatment: The final treatment consists of adding Sodium Hydroxide to adjust the pH of the water, a final dose of Bleach, Fluoride for tooth decay prevention and Zinc Ortho Phosphate to prevent pipe corrosion and reduce any lead or copper from dissolving into the water.

Aeration: Aeration is a new unit process added to the final process. Two 125 HP blowers will blow air into diffusion tubes located at the bottom of the contact chamber. These bubbles will strip any volatile organic compound that may be found in the water. This air stripping process is targeted mainly towards a group of compounds known as Trihalomethanes (THM's). THM's are created when chlorine is added to the water for disinfection. The aeration system is used to remove THM's to lower their concentration to well below acceptable limits.

Analytical Results of Testing for 2018

Inorganic Analysis

Contaminant	Highest Level	Range Detected	Avg. Detected	MCL / MRDL	MCLG / MRDLG	Violation	NOTES
Perchlorate (PPB)	0.35	0.35	0.35	2	0	N	Oxygen additive for solid fuel rockets & missles; Industrial waste.
Fluoride (PPM)	0.94	NA	0.73	4	4	N	Water additive that promotes strong teeth.
Sodium (PPM)	53	NA	53	NA	NA	N	Natural sources; runoff from salt used on roadways; by-product of treatment process.
Nitrate (PPM)	0.69	NA	0.69	10	10	N	Runoff from fertilizer use; leaching from septic tanks; erosion of natural deposits.
Sulfates (PPM)	23.2	NA	NA	NA	NA	N	Soil runoff and detergents; by-product from treatment process.
Chlorite (PPM)	0.47	0.01-0.47	0.17	1	NA	N	Disinfection by-product.

- Perchlorate is found in nature from various sources such as industrial waste, fireworks, improperly disposed of solid rocket fuel and is also found in old bleach. Perchlorate is very stable and hard to remove from water. The value above is barely above the detection limit of the method (0.1 PPB). Massachusetts has the lowest MCL in the nation of 2 PPB.
- Fluoride is added to the water to prevent cavities. Fluoride is very well controlled and the target dosage recently was reduced to 0.80 mg/L to account for all Fluoride sources such as toothpaste and Fluoride rinses.
- Sodium comes from naturally occurring sources and from road-salt runoff. Sodium Hydroxide is also used in the plant to adjust pH and add alkalinity for the coagulation process. 20 mg/L (5 mg/8 oz.) is considered "low-sodium" by the FDA http://water.epa.gov/scitech/drinkingwater/dws/ccl/sodium.cfm.
- Nitrate is a naturally occurring compound which is also produced when our bleach converts ammonia to nitrates in our treatment process. Ammonia is highest in the winter when the river is frozen and is the probable cause for "strong chlorine" smell complaints.
- Sulfates are mostly added to the water from using Aluminum Sulfate (aka ALUM). There is no MCL for sulfate and our concentrations are very low.
- Chlorite is produced when Chlorine Dioxide (disinfectant similar to bleach) reacts with the raw water. Most of the chlorite is removed by the carbon filters but some does pass through. During the warmer months chlorite is normally very low to none detected.

Bacterial Analysis

Contaminant	Highest Level	Range Detected	Avg. Detected	MCL / MRDL	MCLG / MRDLG	Violation	Possible Source
Total Coliform	0.18%	0.18%	0.18%	<5%	0	N	Naturally present in the environment.

On a weekly basis eleven (11) sites are sampled and tested for bacteria and free chlorine. Free chlorine is always detected at all sample sites, which indicates our water is very stable as the residual chlorine gives additional protection against harmful bacteria.

Organic Analysis

Contaminant	Highest Level	Range Detected	Avg. Detected	MCL / MRDL	MCLG / MRDLG	Violation	Possible Source
TTHM (PPB)	64.0	24-64	62.5	80	NA	N	By-product of drinking water chlorination.
HAA5 (PPB)	23.0	5-39	17.7	60	NA	N	By-product of drinking water chlorination.
VOC (PPB)	None Detected	NA	NA				Discharges from industrial chemical facilities.

- Total TriHaloMethanes (TTHM) are produced when bleach is added to water. Four sites are monitored on a quarterly basis and our treatment process is adjusted to minimize the production of THM's.
- Halo Acetic Acids (HAA) is organic compounds produced when bleach is added to water. They are sampled at the same time as TTHM's and are usually very low.
- VOC's there are 65 volatile organic compounds which are tested for each quarter. They range from simples solvents used in industry to other compounds such as Methyl Tertiary Butyl Ether (MTBE) and even Freon. Acetone limits have not been set.

Physical Analysis

Contaminant	Highest Level	Range Detected	Avg. Detected	MCL / MRDL	MCLG / MRDLG	Violation	Possible Source
Turbidity	0.64	0.01-0.64	0.02	0.3	<5%	N	Soil runoff.

- Turbidity is a measurement of how much suspended particles is in the water. Water with high turbidity indicates a problem with the treatment process and can interfere with the free chlorine doing its job. Typically the water that is produced at the plant is very low in turbidity (0.02-0.04) which is measured in Nephlometric Turbidity Units or NTU. As a comparison distilled water has a turbidity of just below 0.02 ntu.
- Asbestos Cement (AC) pipe was used in the late 1940's as an alternative to cast iron pipe. Although it is reinforced by asbestos fibers the interior is cement lined and no fibers can reach the water.

Lead and Copper Monitoring Program (2017)

Contaminant	90th Percentile	# of sites exceeded	# of Sites Sampled	Action Level	MCLG	Violation	Possible Source
Lead (PPM)	None Detected	0	31	0.015	0	N	Corrosion of household plumbing systems; erosion of natural deposits.
Copper (PPM)	0.06	0	31	1.3	0	N	Corrosion of household plumbing systems; erosion of natural deposits.

Next testing date June 30, 2020.

Lead and Copper Program History

Originally over 60 homes were sampled for Lead and Copper analysis. Homes were selected to make sure they contained lead solder and therefore represented "worst case scenario" of pipe corrosion. Special sample bottles are delivered to the homes and the target faucet could not be touched for 24 hours. The first liter of water was sampled and then sent to a certified lab for analysis. Tewksbury has passed all of the Lead and Copper testing cycles since the program started. As a result of our "good" results we are allowed reduced monitoring of only 30 homes. We are required to test for Lead & Copper every three years, and so will again in the summer of 2020.

School Bubbler and Fixture Analysis for Lead & Copper:

The Water Department has operated a fixture monitoring program even before Lead & Copper testing in homes was required. Every bubbler and kitchen fixture was tested in the entire school system and "offending" fixtures were replaced. As the Lead limits were dropped even lower, our Lead & Copper program continued to monitor selected schools as a "search and replace" method was used to insure school fixtures are safe. All fixtures now installed are required to be certified "Lead Free". Our School Lead and Copper Monitoring program will continue as part of our corrosion control program.

Corrosion Control Method:

Zinc Ortho Phosphate is added to the water to reduce corrosion. If new pipes are added or any bare metals surfaces are exposed the zinc "passivates" the metal surface rendering it inactive. The phosphate creates a very thin hard coating on the surface of the pipe interior. This coating creates an insulating barrier so the water technically does not touch the pipe walls. This process helps to keep your porcelain clean of any green discoloration and extends the lifetime of your water pipes. The Zinc concentration is about
0.1 mg/L and the Phosphate concentration runs an average of 0.5 mg/L. The corrosion control effect of this treatment chemical is optimum at a pH of about 7.5 which is also our target pH for finished water. New copper or copper that is repaired will require time for the metal surfaces to become "passivated". As a result it is not unusual that residents will observe pink discoloration on porcelain for a few weeks. This is a copper compound and is only temporary until the new copper is coated.
As always, we thank our volunteer Lead and Copper homes for helping us with this important program.

Helpful Hint:

Flush out your hot water tank once or twice a year to remove sediment. This will keep your hot water cleaner and extend your hot water tank life.

Definitions and Terminology Used in this Report

Maximum Contaminant Level (MCL) – the highest level of a contaminant that is allowed in drinking water.
Maximum Contaminant Level Goal (MCLG) – the level of a contaminant in drinking water below which there is no known or expected risk to health.
Maximum Residual Disinfectant Level (MRDL) - The highest level of a disinfectant (chlorine, chloramines, chlorine dioxide) allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
Maximum Residual Disinfectant Level Goal (MRDLG) - The level of a drinking water disinfectant (chlorine, chloramines, chlorine dioxide) below which there is no known of expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.
Treatment Technique (TT) – A required process intended to reduce the level of a contaminant in drinking water.
Action Level (AL) – The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
PPB – Parts per billion or micrograms per liter (µg/L).
PPM – Parts per million or milligrams per liter (mg/L).

Sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, and in some cases, radioactive material. It can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

Microbial contaminants such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
Inorganic contaminants such as salts and metals, which can be naturally-occurring or result from urban storm-water runoff, industrial, or domestic wastewater discharges, oil and gas production, mining, or farming.
Pesticides and herbicides which may come from a variety of sources such as agricultural, urban storm-water runoff, and residential uses.
Organic chemical contaminants including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm-water runoff, and septic systems.
Radioactive contaminants which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (EPA) prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water that must provide the same protection for public health. All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at 800.426.4791.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and some infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control and Prevention (CDC) guidelines on lowering the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 800.426.4791.

Lead: Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline at 800.426.4791.

THM: Some people who drink water containing Trihalomethanes in excess of the MCL over many years' experience problems with their liver, kidneys, or central nervous systems, and may have increased risk of getting cancer.

Turbidity: Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease causing organisms. These organisms include bacteria, viruses and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

How can business owners help keep our stormwater clean?

- ✓ Keep your dumpster area clean and your dumpster's lid closed. Never fill it with liquid waste or hose it out.

- ✓ Clean mats, filters and garbage cans in a mop sink, wash rack or floor drain connected to the sewer through a grease trap. Never wash them in a parking lot, sidewalk or street.
- ✓ Use dry methods for spill cleanup. Never hose down spills.
- ✓ Recycle grease and oil. Do not pour it into sinks, floor drains, catchbasins or onto a parking lot.
- ✓ Always keep waste liquid bins covered and contained.
- ✓ Recycle solvents, used filters, anti-freeze, batteries, lubricants and metal filings.
- ✓ Use drip pans underneath vehicles to capture fluids. Use absorbent cleaning agents instead of water to clean work areas.

Best Management Practices (BMPs) for Construction Sites

- ✓ Do not store or stockpile materials near a storm drain, catchbasins, wetlands or streams
- ✓ Schedule excavation, grading, and paving operations for dry weather periods

- ✓ Maintain and install silt sacks in catchbasins, hay bales and silt fences as needed
- ✓ Protect stockpiles by storing under a roof, impermeable tarp, or plastic sheeting
- ✓ Prevent erosion by implementing soil stabilization practices such as mulching and temporary seeding
- ✓ Never pump water directly into the town's grated catchbasins, wetlands, stream and rivers

Recycling Locations

Batteries
DPW Building
999 Whipple Rd
Tewksbury, MA
01876

Motor Oils
M & S Service, Inc.
1875 Main St
Tewksbury, MA
01876

This brochure is designed and distributed by:
Town of Tewksbury, MA
Department of Public Works
Engineering Division

Take One

ALL ABOUT STORMWATER

Town of Tewksbury, MA
www.tewksbury-ma.gov/stormwater

What is Stormwater?

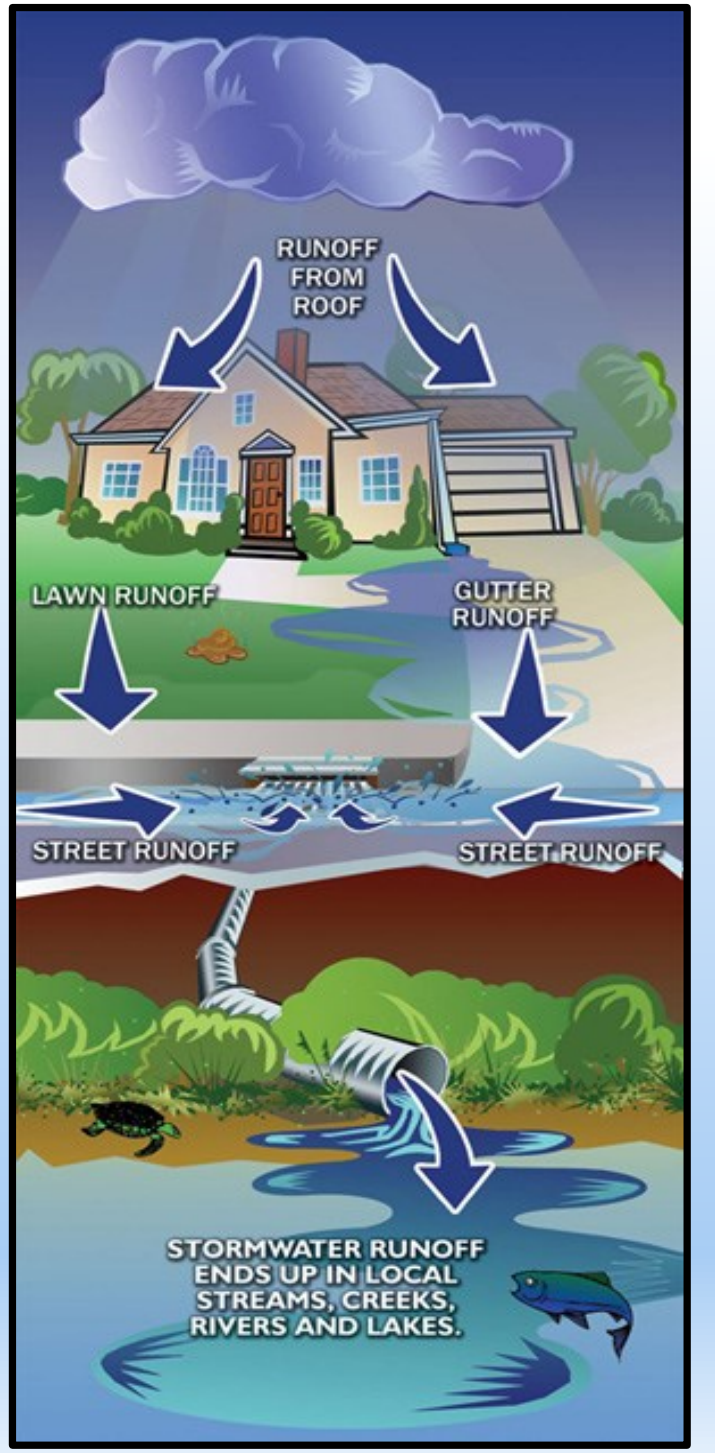
Stormwater is any runoff from rain or snow melt that drains into the Town's drainage systems and ultimately ends up in groundwater, ponds, streams and/or wetland resource areas.

What is the Stormwater Management Program?

The Town of Tewksbury's Department of Public Works manages the Stormwater Management Program and is continuously working on fulfilling the requirements of the EPA's NPDES (National Pollutant Discharge Elimination System) MS4 Stormwater Permit Regulations. The EPA's NPDES Stormwater Permit Regulations is federally mandated for all municipalities to eliminate all pollutants to the waters within their jurisdictions. The Town of Tewksbury's Stormwater Management Program consists of Public Education, Illicit Discharge Detection, System Mapping, Water Quality Testing, Construction Site Runoff Control, and Good House Keeping Practices.

Why Does Stormwater Matter?

As rain or snow melt flows over paved services it carries with it any pollutants such as oils, fertilizer, sand, and trash. The pollutants will eventually enter groundwater, ponds, streams and/or wetland resource areas and will contaminate drinking water supplies, fish and wildlife habitat.



How can residents help keep our stormwater clean?

- ✓ Do not dump household waste such as paint, cleaning products, motor oils, antifreeze, pet waste or any other hazardous material into catch basins, streams, ponds and wetland areas

- ✓ Minimize the use of fertilizers near grated catch basins, streams, ponds and wetland areas
- ✓ Maintain your home's septic tank and leaching field by regularly pumping and repairing when necessary
- ✓ Whenever possible use environmentally friendly, biodegradable products when cleaning outside

- ✓ Do not drain chlorinated swimming pool water into grated catch basins or onto the street
- ✓ If you must wash your car at home, wash it on the lawn to encourage infiltration and use low-phosphate detergents
- ✓ Always dispose of pet waste in the trash

- ✓ Minimize salt use on walkways and driveways near streams, ponds and/or wetland areas
- ✓ Make sure your vehicle or yard equipment is not leaking any oils or fluids
- ✓ Always Remember: **Only Rain in the Drain**

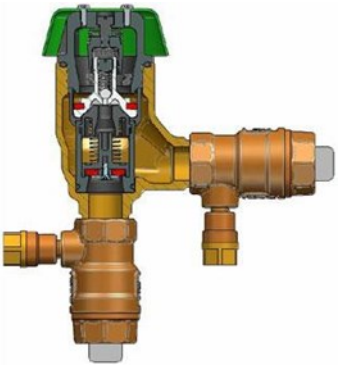
For More Information Please Visit:

www.tewksbury-ma.gov/stormwater

Tewksbury Cross Connection Program

What is a Cross Connection?

A cross connection occurs when the potable drinking water system is physically connected to a possible source of contamination. A connection to a private well, an industrial process containing harmful chemicals or a fire water storage tank or even a hose left in a bucket of insecticide. In either case, if a sudden drop in pressure occurs, caused by a fire or a broken water main, back syphoning may occur and someone may get hurt. Learn how to prevent this and other situations.



Cross section of a Pressure Vacuum Breaker; this device is required on lawn irrigation systems to prevent pollution, fertilizers and insecticides from being pulled from your lawn and back into your house. Water flows from the bottom section and the water pressure forces the spring loaded diaphragm at the top closed, allowing water to reach your sprinkler heads under pressure. If the water flow reverses, then the device allows air to enter from the top and "breaks" the vacuum. That's why it's called a Pressure Vacuum Breaker or PVB. This device is so sensitive it can detect and instantly "break" a vacuum of 1 PSI or greater. Testing insures that your device is working correctly.

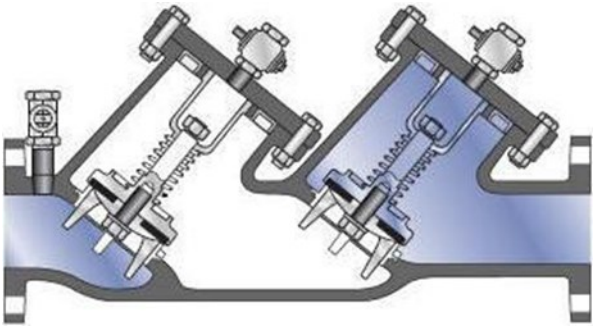
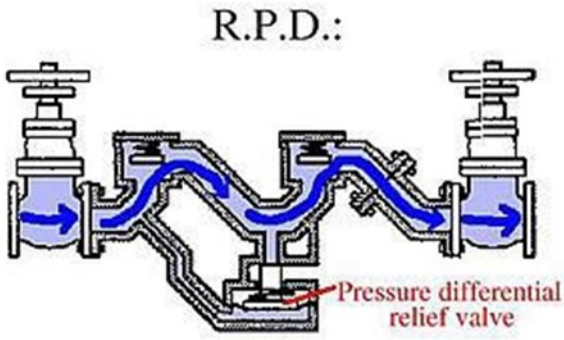


Diagram of a Double Check Valve Assembly; this is a simple backflow device more commonly used in fire sprinkler systems. If one check valve is good then two must be better. Some of these devices, when installed in large buildings, can be several feet long and weigh hundreds of pounds. But no matter how large, they all must have the same sensitivity to protect the water supply from backflows.



Reduced Pressure Zone (or device) is a highly sensitive and efficient backflow protector designed to protect a water system or facility from what is referred to as high hazards. RPZ's have two (2) check valves and then one differential relief valve in the middle. When a backflow occurs the relief valve opens to allow air in to "break" the vacuum created. This device will continue to work even if one or both check valves are compromised.

Total Containment Policy: Tewksbury uses a Total Containment Policy which requires all Commercial, Industrial, Municipal and Institutional properties to install an RPZ at the meter.

What is the Owners Responsibility?

Owners of any industrial, commercial, agricultural, municipal and/or private residence are required to eliminate any cross connections. If the cross connection cannot be eliminated, then a backflow device may be required. Not sure? Please call 978-858-0345 ext. 100 or email rnichols@tewksbury-ma.gov.

If you have a private well there cannot be any physical connection between the well and the Town's water system. All Owners, in accordance with MaDEP regulations, must have a rebuild kit on hand in order to minimize downtime.